California Environmental Protection Agency

Air Resources Board

ARB Approved

Installation, Operation and Maintenance Manual

For Standing Loss Control Vapor Recovery System for New Installations of Aboveground Storage Tanks As Certified by Executive Order VR-302-A

April 2, 2009

NOTICE:

The **ARB Approved Installation, Operation and Maintenance Manual for the Standing Loss Control Vapor Recovery System for New Installations of Aboveground Storage Tanks** (AST) describes the tools and methods required to install the Standing Loss Control Enhanced Vapor Reduction (EVR) System.

The AST manufacturers written instructions, procedures and guidelines will be adhered to when installing, operating and maintaining ASTs or the warranty will be void. It is the owner's (of the AST) responsibility to ensure that the Standing Loss Control EVR System is properly and safely installed, operated and maintained on their ASTs. The owner may also choose to hire any qualified contractor or technician to install, operate and maintain the Standing Loss Control EVR System on their ASTs. All the current requirements of state, federal and local codes for installation and repair of gasoline dispensing equipment must be adhered to. Installation, operation and maintenance of the Standing Loss Control EVR System must also meet all the necessary safety precautions and site safety requirements to assure a safe and trouble free installation.

A list of recommended qualified technicians/contractors can be located by contacting the manufacturer of the Standing Loss Control EVR System. The following is a list of manufacturers and their contact information:

Husky Corporation
2325 Husky Way
Pacific, Missouri 63069
Phone: (800) 325-3558

Modern Custom Fabrication
SuperVault Protected AST
2421 E. California Avenue
Fresno, California 93721
Phone: (800) 800-8268

Steel Tank Institute
Fireguard Protected AST
944 Donata Court
Lake Zurich, Illinois 60047
Phone: (847) 438-8265
Manufacturers of Fireguard Protected ASTs can be found at:
http://www.steeltank.com/FindaFabricator/tabid/55/Default.aspx

Standing Loss Control Vapor Recovery System
Installation, Operation and Maintenance Manual for New Installations of Aboveground Storage Tanks

Table of Contents

Summary of Maintenance Required of the Standing Loss Control Vapor Recovery System

Component	Interval	Maintenance To Be Performed
Pressure/Vacuum Vent Valve Husky 5885	Annual	**1.** Remove screws that hold on the top cover. Do not remove the screens. **2.** Remove any debris from inside the lower cover **3.** Check the drain holes in the lower cover. **4.** Reinstall the top cover **5.** Tighten the screws firmly
Modern Custom Fabrication SuperVault MH Series Aboveground Storage Tanks	Weekly	**1.** Check the operation of the emergency vents for free movement and no obstructions **2.** Spill pan should be clean and free of obstructions **3.** Check tank monitoring device if equipped **4.** Inspect surface (paint) of tank for chips or corrosion
Steel Tank Institute Fireguard Protected Aboveground Storage Tanks	Periodically Monthly	**1.** Inspect proper drainage around the AST area **2.** Inspect the tank exterior to ensure the integrity of the coating **1.** Inspect for the presence of water at the lowest possible points inside the primary tank

(End of maintenance table.)

[1] These maintenance requirements shall not circumvent use of the manufacturer's installation and maintenance instructions. Maintenance contractors or owner/operators shall refer to the manufacturers complete installation and maintenance instructions found herein to ensure that all maintenance requirements are met. Maintenance must be conducted within the interval specified from the date of installation and at least within the specified interval thereafter.

Standing Loss Control EVR Installation Equipment Check List
Installing Products per ARB Executive Order VR-302-A

Site Location:*(name)* _____
Address: _____
City/State: _____
Contact/Phone: _____
Installing Contractor:(name) _____
Address: _____
City/State: _____
Contact/Phone: _____
Tank Number:_____ Product:_____Capacity:_____
Tank Number:_____ Product:_____Capacity:_____
Tank Number:_____ Product _____Capacity:_____
Installing Technician: *(name)*: _____
Technician Certification Number: _____
Signature: _____

Yes/No	Initials

1. Is all of the installed equipment for Standing Loss Control EVR listed in ARB Executive Order (E.O.) VR-301-A?

Note: All Standing Loss Control Vapor Recovery installed equipment must be listed in E.O. VR-302-A. See attached Exhibit 1 Checklist, and /check each item installed.

Yes/No	Initials

2. Pressure Vacuum Vent Valve – Is there a P/V Vent valve installed on the top of each (gasoline) vent pipe (a maximum of three EVR P/V valves per GDF) or manifold?

a. P/V vent valve(s) torqued to _____ ft. lbs.

Yes/No	Initials

3. Modern Custom Fabrication SuperVault MH Series – Has the SuperVault AST been installed with the proper pressure/vacuum vent valve ?

a. Describe any issues:_____
_____

Yes/No	Initials

4. Steel Tank Institute Fireguard Protected AST – Has the Fireguard AST been installed with the proper pressure/vacuum vent valve?

a. Describe any issues:_____
_____

Standing Loss Control Vapor Recovery System Exhibit 1 Equipment Checklist

From the list below, check the box for each component you used:

Pressure/Vacuum Vent Valve	€ Husky 5885
Protected Aboveground Storage Tanks	€ Modern Custom Fabrication SuperVault Model MH Series
	€ Steel Tank Institute Fireguard Protected AST

Figure A-1
Husky Model 5885 2-Inch Threaded Pressure/Vacuum Vent Valve

MODEL #5885
Recommended Installation, Maintenance and Inspection Instructions

EVR Pressure Vacuum Vent

5885

WARNING Designed for use at motor fuel dispensing facilities only.

INSTALLATION INSTRUCTIONS

NOTE: Always adhere to installation / usage instructions and warnings. Improper use may result in injury, damage or hazardous spill.

1. Remove the vent from the carton and visually inspect for any shipping damage.
2. Apply fuel resistant pipe sealant to the threads on the 2" vent stack.
3. Screw the Pressure Vacuum (P/V) vent onto the vent stack and tighten to a range of 20 to 50 ft-lbs with a suitable wrench.
4. DO NOT OVERTIGHTEN

TESTING / MAINTENANCE / INSPECTION

Testing Criteria Per TP201.1E and Exhibit 3 of applicable Phase 1 E.O.

Leak rate: Pressure = .05 CFH @ 2" wc, Vacuum = .21 CFH @ -4" wc.
Cracking Pressure = 2 1/2" to 6" wc, Vacuum = -6" to -10" wc.

.

Annually Inspect the P/V vent valve for foreign objects:

1. Remove the screws that hold on the top cover. Do not remove the screens.
2. Remove any debris from inside the lower cover.
3. Check the drain holes in the lower cover.
4. Reinstall the top cover.
5. Tighten the screws firmly.

- All drive aways, maintenance and inspection activities must be logged using the serial number of the individual product.
- Apply city, state, or federal testing regulations as appropriate.

ANY TEST / INSPECTION FAILURE REQUIRES IMMEDIATE EQUIPMENT REPLACEMENT OR REMOVAL FROM SERVICE.

MADE IN THE USA

Husky Corporation • 2325 Husky Way • Pacific, MO 63069 • Phone: (800) 325-3558 • Fax: (636) 825-7300 • www.husky.com

Figure A-1 (continued)
Husky Model 5885 2-Inch Threaded Pressure/Vacuum Vent Valve

ALWAYS ADHERE TO INSTALLATION / USAGE INSTRUCTIONS AND WARNINGS.
Improper use may result in injury, damage, or hazardous spill.

GENERAL WARNINGS / INSTRUCTIONS

- Use of equipment is at individuals' own risk.
- Always abide and adhere to city, state, and federal regulations regarding use and installation of dispensing equipment.
- Always follow the dispenser manufacturer's instructions.
- Always turn off all power to dispenser during maintenance and inspection activities.
- Always close the shear valves during maintenance and inspection activities.
- Always relieve pressure from system prior to performing maintenance activities.
- Always check continuity after installation using a megohmeter (Refer to PEI RP 400 for details).
- Always replace or remove from service damaged or leaking dispensing equipment immediately.
- Always report leaks / spills / accidents to appropriate authorities.
- Always wear appropriate safety equipment during maintenance activities.
- Always have appropriate fire extinguishing equipment within 5 feet of dispensers.
- Always use pipe sealant approved for gasoline service.
- Always place containers on the ground before filling.
- Always discharge static electricity before using or servicing equipment by touching a metal part of the dispenser before and after fueling vehicle.
- Never smoke within 20 feet of dispensers.
- Never keep in service past recommended life.
- Never leave the nozzle unattended while dispensing fuel.
- Never use sparking or flaming devices within 20 feet of dispensers.
- Never use power tools near dispensers or to aid in the installation process.
- Never use cell phone within 20 feet of dispensers.
- Never reenter car when fueling vehicle.
- Never allow gasoline to touch eyes or skin.
- Never use at flow rates in excess of regulatory guidelines.
- Never use at flow rates less than 5 gallons per minute.
- Never dispense flammable material into unapproved containers.
- Never dispense fuel without a valid driver's license.

CAUTION: DO NOT ALTER OR COVER
THE P/V VENT

Figure A-1 (continued)
Husky Model 5885 2-Inch Threaded Pressure/Vacuum Vent Valve

TROUBLESHOOTING GUIDE

Pressure Decay Test Failure...	1. Test vent to CARB TP201.1E. 2. Replace vent.

For stations with ISD monitoring

Vapor leak...	1. Verify other equipment is not the cause. 2. Test vent to CARB TP201.1E 3. Replace vent.
Exceeds allowable system cracking pressure...	1. Replace vent

GENERAL TECHNICAL DATA

Fuel Type	Test and warranty for gasoline and diesel fuel
Body	Sand cast aluminum
Screens	Stainless Steel 40 mesh
Seal	Nitrile Foam
Covers	Aluminum
Weight	1.2 lbs
Threads	2" NPT
Case Quantity	20
Listings	CARB UL
Patents	5,957,157

ACCESSORIES

Part #5041
3" to 2" Threaded Adaptor

Installation Procedure:
1. Visually inspect the o-ring and threads for chips, dirt & debris.
2. Apply fuel resistant pipe sealant to the 3" NPT threads of the vent pipe.
3. Screw the P/V vent adaptor onto the vent stack by hand.
4. Apply fuel resistant pipe sealant to the 2" NPT threads of the P/V vent adaptor.
5. Screw the P/V vent onto the adaptor and tighten to a range of 20 to 50 ft-lbs. with a suitable wrench. Do not overtighten.

Part #5426
Test Adaptor

NOTE: This adaptor is designed to fit on the inlet of the P/V Vent to allow for field and lab tests.

Installation Procedure:
1. Screw P/V Vent adaptor into the P/V Vent valve until hand tight. Make sure the seal is compressed.
2. Place the P/V Vent valve and adaptor on a flat surface.
3. Attach a 3/16" hose (Tygon fuel tubing) from test apparatus to hose barb on the side of the adaptor.
4. After testing, remove hose from barb and remove adaptor from vent.

Figure B-1
Modern Custom Fabrication SuperVault MH Series Protected Aboveground Storage Tanks

SUPERVAULT MH
Multi-Hazard Rated

INSULATED AND PROTECTED
ABOVEGROUND FUEL STORAGE TANKS

Cylindrical and Rectangular Styles

Owners Manual

SUPERVAULT MH

•Smart •Safe •Secure •Reusable
Fire after Fire, Bullet after Bullet, Impact after Impact

Figure B-1 (continued)
Modern Custom Fabrication SuperVault MH Series Protected Aboveground Storage Tanks

SUPERVAULT MH

LISTINGS

Figure B-1 (continued)
Modern Custom Fabrication SuperVault MH Series Protected Aboveground Storage Tanks

SuperVault MH

Multi-Hazard Rated Insulated and Protected Aboveground Fuel Storage Tanks

Cylindrical and Rectangular Styles

TESTING RESULTS

Tests Performed by Southwest Research Institute, San Antonio, Texas

NATIONAL STANDARDS REQUIRE DEMONSTRATED RESISTANCE TO HIGH INTENSITY LIQUID POOL FIRE EXPOSURE

	Actual Results		Pass/Fail Criteria					
	Initial Test	Retest	SwRI 95-03		UFC Std A-II-F-1		UL2085 Protected	
Starting Temperature	80	61	Initial Test	Retest	Initial Test	Retest	Initial Test	Retest
2 Hour Results								
○ Average Temp Rise (°F)	134	139	260	260	260	*	800	*
○ Max. Absolute Temp. (°F)	275	212	400	400	400	*	1080	*
4 Hour Results								
○ Average Temp Rise (°F)	165	n/a	260	*	*	*	*	*
○ Max. Absolute Temp. (°F)	323	n/a	400	*	*	*	*	*

A sample tank was placed in a 2000 °f blast furnace. Thermometers located throughout the tank measure the temperature rise.
* No requirements

HOSE STREAM RESISTANCE

SwRI STANDARDS 95-03 AND 93-01 AND UFC STANDARDS A-II-F-1 REQUIRE DEMONSTATION RESISTANCE TO HOSE STREAM IMPINGEMENT ON THE TEST TANK IMMEDIATELY AFTER CONCLUSION OF THE RATED FIRE EXPOSURE PERIOD.

For a 4 Hour Fire Rating the hose stream test is 5 minutes of a 45 PSI stream administered through a 1-1/8" fire nozzle. The pass/fail criteria is that the primary tank must remain leak tight after application of the hose stream to test tank.
Not only did the primary tank of the SuperVault MH remain leak tight but there was NO PENETRATION of the outer steel tank and NO LOSS of insulation.

PROJECTILE RESISTANCE

SwRI STANDARD 95-03 AND 93-01 AND UFC STANDARDS A-II-F-1 AND UL 2085 PROTECTED REQUIRE DEMONSTRATION RESISTANCE TO PROJECTILE PENETRATION OF THE PRIMARY TANK.

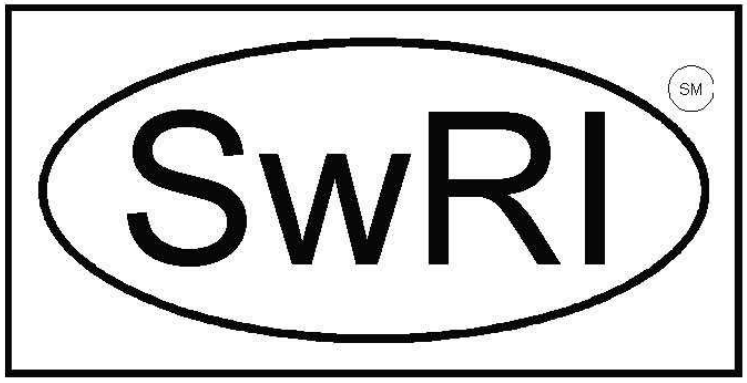
After conclusion of the hose stream test the SuperVault MH was subjected to 5 rounds of 150-grain, M-2 ammunition discharged from a 0.30 caliber rifle at a distance of 100 feet. The minimum muzzle velocity of the rounds was 2700 ft/sec. bullet resistance is the basis for Projectile Penetration Resistance rating. The SuperVault MH withstood all 5 rounds without penetration of the primary tank.

IMPACT RESISTANCE

SwRI STANDARD 95-03 AND 93-01 AND UFC STANDARD AII-F-1 AND UL 2085 PROTECTED REQUIRE DEMONSTRATION RESISTANCE TO HEAVY VEHICLE IMPACT WITHOUT PENETRATION OF THE PRIMARY TANK.

After anchoring in accordance with the manufacture's instructions the tank will be subject to an impact of 12,000 pounds traveling at 10 mph applied at 18" above the ground surface. The SuperVault MH withstood the impact without penetration of the primary tank.

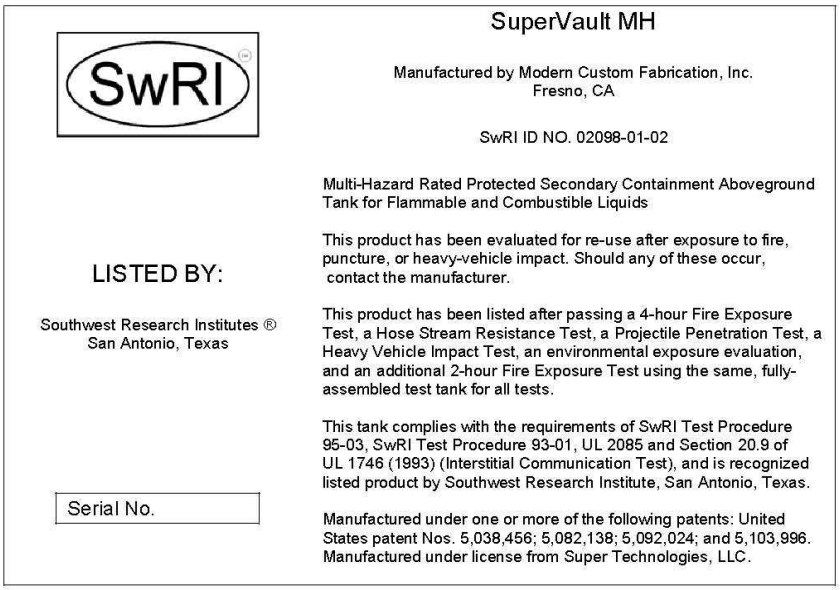
Figure B-1 (continued)
Modern Custom Fabrication SuperVault MH Series Protected Aboveground Storage Tanks



This mark on the product signifies that the product is listed by Southwest Research Institute.

The SuperVault MH is listed for compliance with SwRI Standards 95-03 and 03-01, Uniform Fire Code standard A-II-F-1 (formerly known as UFC 79-7) and UL 2085 Protected. The label on the tank bears the SwRI logo as evidence of listing and indicates compliance with the national standards listed above.

Figure B-1 (continued)
Modern Custom Fabrication SuperVault MH Series Protected Aboveground Storage Tanks



SuperVault MH tank Label for Fresno

Figure B-1 (continued)
Modern Custom Fabrication SuperVault MH Series Protected Aboveground Storage Tanks

SUPERVAULT MH

INSTALLATION

Figure B-1 (continued)
Modern Custom Fabrication SuperVault MH Series Protected Aboveground Storage Tanks

Installation Instructions

These instructions are for the stationary installation of the **SuperVault MH** aboveground tank used for the storage of petroleum products at atmospheric pressure.

No amount of written instruction, provided by manufacturers or regulatory agencies, will serve to convert an incompetent or under supervised mechanic into a competent craftsman. Installation of storage systems for flammable and combustible liquids is a unique field. The ability to recognize and react to unexpected, abnormal conditions that may occur during a tank installation requires experience as well as skill.

In addition to proper system design and operation, use of tank installers who possess both the experience and integrity to insist on doing the job right constitutes the greatest protection against ultimate tank system failure and liability exposure.

Your **SuperVault MH** must be installed in Accordance with all applicable federal, state and local environmental regulations and safety codes.

Location

Tank must meet local requirements. The enclosed "Clearance Requirements" diagram is based on the 2003 International Fire Code and is for reference only. Always check with your local authorities for their particular requirements before starting work.

Foundation

Tank foundation must comply with local Building Code regulations. Ask your local Fire Department or Building Department for recommendations. Modern Custom Fabrication Inc. recommends that at a minimum the concrete footing should be sufficiently above grade to prevent accumulation of debris, dirt and water around the tank supports.

The **SuperVault MH** tank supports and base plates meet the requirements of 2007 California Building Code. Expansion joint material that will not absorb water (asphalt impregnated fiberboard) should be placed between the tank supports and the concrete foundation.

Handling

Do not handle or install tank without having knowledge and experience in procedures involved with safe aboveground tank installation.

Before any attempt is made to move a tank, it should be established that hoisting equipment has sufficient capacity and reach to safely lift and lower the tank without dragging or dropping.

Lifting with nylon straps is preferred to prevent damage of the tank coating. The straps must be clean to avoid scratching the tank coating.

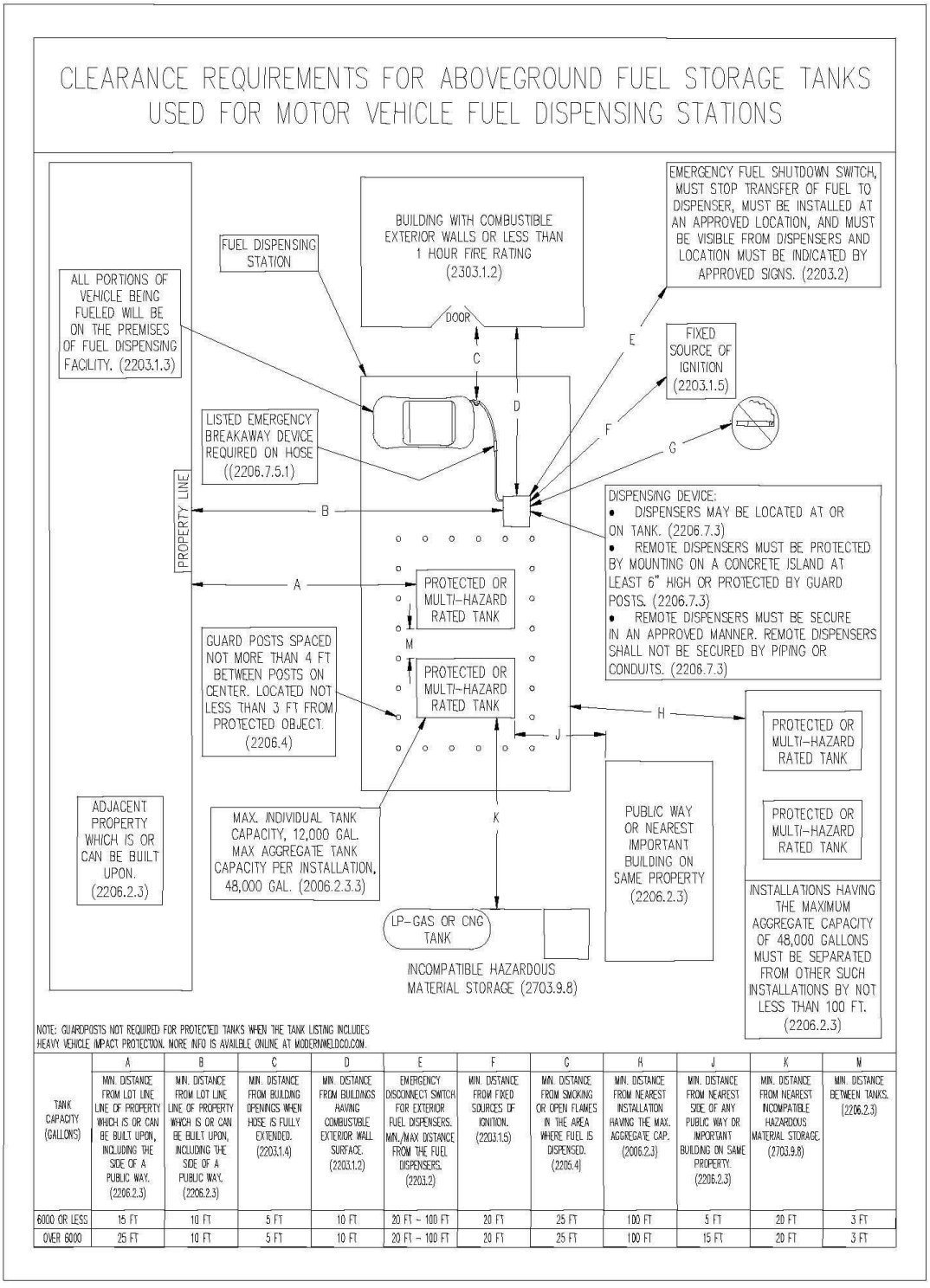
Do not push, drag or drop the SuperVault MH.

Do not handle or move the SuperVault MH unless it is empty.

Venting

All aboveground fuel storage tanks are required to have emergency vents to prevent the buildup of pressure. The emergency venting requirement for **SuperVault MH** tank must be provided by the use of emergency vent valve attached to a properly sized primary tank fitting. The tank manufacturer provides emergency venting for secondary tank by means of relief caps over the pour ports.

Figure B-1 (continued)
Modern Custom Fabrication SuperVault MH Series Protected Aboveground Storage Tanks



NOTE: GUARDPOSTS NOT REQUIRED FOR PROTECTED TANKS WHEN THE TANK LISTING INCLUDES HEAVY VEHICLE IMPACT PROTECTION. MORE INFO IS AVAILBLE ONLINE AT MODERNMELDCO.COM.

TANK CAPACITY (GALLONS)	A MIN. DISTANCE FROM LOT LINE LINE OF PROPERTY WHICH IS OR CAN BE BUILT UPON, INCLUDING THE SIDE OF A PUBLIC WAY. (2206.2.3)	B MIN. DISTANCE FROM LOT LINE LINE OF PROPERTY WHICH IS OR CAN BE BUILT UPON, INCLUDING THE SIDE OF A PUBLIC WAY. (2206.2.3)	C MIN. DISTANCE FROM BUILDING OPENINGS WHEN HOSE IS FULLY EXTENDED. (2203.1.4)	D MIN. DISTANCE FROM BUILDINGS HAVING COMBUSTIBLE EXTERIOR WALL SURFACE. (2203.1.2)	E EMERGENCY DISCONNECT SWITCH FOR EXTERIOR FUEL DISPENSERS. MIN./MAX DISTANCE FROM THE FUEL DISPENSERS. (2203.2)	F MIN. DISTANCE FROM FIXED SOURCES OF IGNITION. (2203.1.5)	G MIN. DISTANCE FROM SMOKING OR OPEN FLAMES IN THE AREA WHERE FUEL IS DISPENSED. (2205.4)	H MIN. DISTANCE FROM NEAREST INSTALLATION HAVING THE MAX. AGGREGATE CAP. (2006.2.3)	J MIN. DISTANCE FROM NEAREST SIDE OF ANY PUBLIC WAY OR IMPORTANT BUILDING ON SAME PROPERTY. (2206.2.3)	K MIN. DISTANCE FROM NEAREST INCOMPATIBLE HAZARDOUS MATERIAL STORAGE. (2703.9.8)	M MIN. DISTANCE BETWEEN TANKS. (2206.2.3)
6000 OR LESS	15 FT	10 FT	5 FT	10 FT	20 FT – 100 FT	20 FT	25 FT	100 FT	5 FT	20 FT	3 FT
OVER 6000	25 FT	10 FT	5 FT	10 FT	20 FT – 100 FT	20 FT	25 FT	100 FT	15 FT	20 FT	3 FT

Figure B-1 (continued)
Modern Custom Fabrication SuperVault MH Series Protected Aboveground Storage Tanks

SUPERVAULT MH

TESTING

Figure B-1 (continued)
Modern Custom Fabrication SuperVault MH Series Protected Aboveground Storage Tanks

TESTING

Each SuperVault MH is leak tested during the fabrication process by using 5 PSI of positive pressure internally and externally applying a leak detecting solution to all seams and joints. This is performed on both the primary and secondary tanks. Should the owner require additional field testing, the following procedure is offered to meet this requirement.

Warnings:

1. Do not air test a tank which has previously contained flammable or combustible liquids.
2. Air pressure used for this test must not exceed 5 PSI.

Figure B-1 (continued)
Modern Custom Fabrication SuperVault MH Series Protected Aboveground Storage Tanks

Procedure No. SV-P1

SUPERVAULT MH ABOVEGROUND PROTECTED FUEL STORAGE TANK

PRIMARY TANK FIELD TESTING

These tanks are thoroughly tested at the factory and certified to be leak free. Should the owner require additional field testing, the following procedure is offered to meet this requirement.

Modern Custom Fabrication Inc. is not responsible for any cost incurred relating to field testing.

PROCEDURE

1. Cap openings and install test equipment in the order listed below starting at compressor or air supply.
    a. Pressure reducing valve (5 PSI on outlet side)
    b. 0 to 5 PSI pressure gage
    c. 5 PSI pressure relief valve
    d. Shut-off valve
    e. 0 to 5 PSI pressure gage at tank
2. Slowly raise tank pressure to 4 PSI. CAUTION: Do not exceed 4 PSI.
3. Close shut-off valve when test pressure of 4 PSI is reached.
4. Leak test all pipe caps and test manifold with leak-detecting fluid to insure no loss of air pressure at these points.
5. Record time and pressure gage reading on a Test Log every 5 minutes. After 30 minutes have elapsed, record final pressure test and time.
6. No more than a 1% loss in test pressure over test period is allowed for tank to satisfactorily pass pressure test.

CERTIFICATION

The undersigned hereby certify that the pressure test was performed in strict conformance with this procedure for the SuperVault listed below.

Performed By: _____ (Company Name) _____ (Company Representative Signature)

_____ (Date of Test) _____ (Company Representative Name (Please Print))

Witnessed By: _____ (Regulating Authority) _____ (Regulator/Inspector Signature)

_____ (Regulator/Inspector Name (Please Print)) _____ (Time)

Tank Owner: _____ Customer P.O. No. _____

Installation Address: _____ Delivery Date _____

_____ Installation Date _____

_____ Tank Serial No. _____

Figure B-1 (continued)
Modern Custom Fabrication SuperVault MH Series Protected Aboveground Storage Tanks

SuperVault MH Test Log

Date of Test _____

Tank Serial No. _____

Test Start Time _____

		Record Pressure
4 PSI Reached	(Time) _____	(PSI) _____
1. 5 minute lapse	(Time) _____	(PSI) _____
2. 5 minute lapse	(Time) _____	(PSI) _____
3. 5 minute lapse	(Time) _____	(PSI) _____
4. 5 minute lapse	(Time) _____	(PSI) _____
5. 5 minute lapse	(Time) _____	(PSI) _____
6. 5 minute lapse	(Time) _____	(PSI) _____

No more than a 1% loss in test pressure over test period is allowed for tank to satisfactorily pass pressure test.

Figure B-1 (continued)
Modern Custom Fabrication SuperVault MH Series Protected Aboveground Storage Tanks

SUPERVAULT MH

MAINTENANCE

Figure B-1 (continued)
Modern Custom Fabrication SuperVault MH Series Protected Aboveground Storage Tanks

Maintenance

These maintenance procedures cover the tank only. Different applications and sizes of tanks create a variety of equipment configurations that would be impossible to cover in this section. Follow the equipment manufacturer's recommendation for maintenance schedules.

The following tank components should be inspected at least once a week:

Emergency and Normal Vents

Check the operation of the vents for free movement and no obstructions.

Spill Pan

Spill pan should be clean and free of obstructions. Drain valve must have free movement and be normally closed during operation of the tank.

Monitor Tube

Ensure the monitor tube is dry. This can be accomplished by sticking the tube with the gauge stick that is supplied with the tank. If the tank is equipped with a mechanical or electronic monitoring device, test it for proper operation.

Finish

Inspect surface of the tank for chips or corrosion. If found sand, clean and paint in accordance with the paint manufacturer recommendation.

Fuel

Impurities and moisture in fuel can damage the tank and equipment. Check with your fuel supplier for assistance with a clean fuel program and check for procedures to eliminate containments, including water from your fuel.

Figure B-1 (continued)
Modern Custom Fabrication SuperVault MH Series Protected Aboveground Storage Tanks

FUEL STORAGE TANK MONITORING LOG RECORD

DATE	GASOLINE	DIESEL	OPERATOR	COMMENTS
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
Additional notes for this period:				

DIRECTIONS: WEEKLY

1) Tank operator to write in the date the tank leak monitor or indicator is checked.
2) Operator write in condition observed for each tank, i.e. dry or fuel present.
3) Operator to initial and comment on condition of each tank.
4) Report any liquid present in the monitor tube or alarm condition to your supervisor.
5) Tanks fitted with float actuated LEAK GAUGE have viewing indicator window. CLEAR indicates NO LEAKS, RED indicates LEAK. Check gauge periodically for proper operation.

Figure B-2
Steel Tank Institute Fireguard Protected Aboveground Storage Tanks

Steel Tank Institute

R942

LIGHTWEIGHT DOUBLE-WALL STEEL ABOVEGROUND STORAGE TANKS

INSTALLATION INSTRUCTIONS

FIREGUARD LIGHTWEIGHT DOUBLE WALL STEEL TANK INSTITUTE

FEBRUARY 2007

1.0 TANK SITE EVALUATION AND PREPARATION PRIOR TO INSTALLATION

1.1 The foundation must be designed to support the tank plus 100% of its contents when full. The foundation design shall also take into account the type of support that is being used and the point load associated with that support. The foundation may be constructed using concrete, asphalt, gravel or other stable material and must include provisions in its design to prevent tank movement. The foundation should include any provisions necessary for seismic design.
The foundation design must also include provision for draining surface water away from the tank.

1.2 For tank installations without cathodic corrosion protection, the tank should be grounded in accordance with applicable electrical and fire code standards.

1.3 Where the steel tank body is in contact with the earth, use a zinc grounding rod. Do not use a copper grounding rod.

1.4 Where the steel tank body is in contact with the earth or foundation, it should be protected from external corrosion. For external corrosion protection using cathodic corrosion protection, consult applicable standards (i.e., National Association of Corrosion Engineers) to provide the tank with appropriate protection from lightning without interference with the corrosion protection. Steel tanks in contact with the earth should not use copper grounding. Refer to STI R893-89, "Recommended Practice for External Corrosion Protection of Shop Fabricated Aboveground Storage Tank Floors."

1.5 Tanks located in areas subject to flooding must be protected against floatation.

1.6 Aboveground tanks should not be located above underground utilities or directly beneath overhead power lines.

1.7 The tank shall be protected from vandalism and accidental damage in accordance with all applicable codes, i.e., NFPA 30, NFPA 30A, UFC, etc. as well as local environmental regulations and safety codes. Consult local authorities before installing this tank.

2.0 TANK HANDLING

2.1 Do not handle or install the tank without having knowledge and experience in procedures involved with proper and safe installation of an aboveground tank used for storage of stable, flammable and combustible liquids.

2.2 Equipment for handling the tank shall be of adequate size to lift and position the tank. DO NOT DROP OR DRAG THE TANK.

2.3 Tanks shall be carefully handled using cables or chains of adequate length (with spreader bars, if necessary) and size. Attach to the tank using the lifting lugs provided. Care should be taken that the angle between the two cables, at the lift point, shall be no greater than 60 degrees.

2.4 DO NOT HANDLE OR MOVE THE TANK UNLESS IT IS EMPTY.

2.5 This is a stationary tank. Do not use this tank for transport of any product.

3.0 TESTING

3.1 General Requirements

3.1.1 An on-site air test of the tank may be required by local authorities to ensure no damage has occurred in shipping and handling. All testing shall be done as described below.

3.1.2 Vacuum monitored double wall tanks are shipped from the manufacturer with a vacuum drawn on the space between the walls. Read and record the vacuum pressure. If the vacuum gauge reading is less than 12 inches

Figure B-2 (continued)
Steel Tank Institute Fireguard Protected Aboveground Storage Tanks

Hg (40.5 kPa), contact the original tank manufacturer.

3.1.3 In lieu of the air pressure test described below, a vacuum may be applied to the interstice of a double-wall tank or to the interstice of a double-bottom tank. DO NOT APPLY A VACUUM TO THE PRIMARY TANK OF A DOUBLE-WALL TANK OR TO A SINGLE-WALL TANK. A vacuum of 7" to 10" Hg is to be applied to the interstice and held for at least 24 hours with no more than a 2" Hg vacuum loss allowed. If this vacuum cannot be held for 24 hours, then perform the air test procedure described below.

3.1.3.1 Caution must be taken in applying a vacuum to the interstice of a tank and the testing must be stopped if any deformation appears on the tank.

3.2 Air Pressure Test Procedure for Tanks

3.2.1 Remove emergency vents and cap openings to hold tank pressure as required.

NOTE: Use only calibrated air pressure gauges with a 0-15 psig (0-103 kPa) dial span. The relief valve must have a flow rate at the set pressure that is greater than the flow rate of the air supply line. The regulated air supply test pressure used for this test should be as follows:

a. **Horizontal cylindrical tanks** - Not less than 3 psig (20.7 kPa) nor more than 5 psig (34.5 kPa) . Set the pressure relief valve in the test air supply line at 5.5 psi (38 kPa).

b. **Vertical tanks**-Not less than 1½ psig (10.4 kPa) nor more than 3 psig (20.7 kPa). Set pressure relief valve in test air supply line at 3 psig (20.7 kPa).

c. **Rectangular tanks**-Not more than 3 psig (20.7 kPa). Set pressure relief valve in test air supply line at 3 psig (20.7 kPa).

CAUTION: Do not leave pressurized tank unattended while the pressure line/air line is connected. Do not stand in front of tank heads or fittings when pressurizing tank. Pressurizing of large tanks may result in the slight deformation of the top and bottom of vertical tanks, of the sides of rectangular tanks, and of the heads and ends of cylindrical tanks. Should deformation appear severe, immediately relieve the pressure.

3.2.2 Tank Pressurizing Procedure

3.2.2.1 The following air pressure testing does not apply to double-wall tanks equipped with interstitial vacuum monitoring systems. (In lieu of the air pressure test, the tank may be shipped from the factory with a vacuum in the tank interstice. Read and record the vacuum pressure. If the vacuum pressure gauge reading is less than 12 inches Hg (40.5 kPa), contact the tank manufacturer).

3.2.2.2 Install test piping as shown in Figure 2. Close valves A and B. Open valve C. Temporarily plug, cap or seal off remaining tank openings to hold pressure.

3.2.2.3 Connect the regulated test air supply line to test piping as shown in Figure 2.

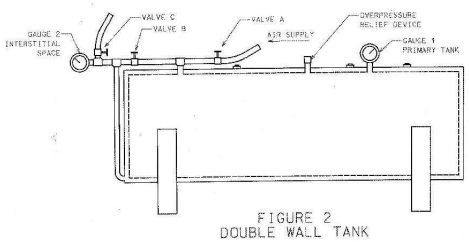


FIGURE 2
DOUBLE WALL TANK

3.2.2.4 Close valves B and C. Slowly open valve A to pressurize the primary tank. Pressure gauge 1 should indicate test air pressure given in Section 3.2.1 above.

3.2.2.5 Close valve A. Disconnect the regulated test air supply line from the test piping.

3.2.2.6 Monitor test pressure in the primary tank for 1 hour minimum. A steady drop in pressure reading for gauge 1 indicates there may be a leak in the primary tank. Check the fittings, the gauge, and then retest. If the problem persists, contact the tank manufacturer.

3.2.2.7 If no leaks are found, close valve C and slowly open valve B to pressurize the interstitial space between the double walls of the tank.

Figure B-2 (continued)
Steel Tank Institute Fireguard Protected Aboveground Storage Tanks

WARNING: Do not apply air pressure to the interstitial space between the walls of a double wall tank without air pressure in the primary tank. Do not apply air pressure to the interstitial space that is higher than the air pressure in the primary tank. Damage to the tank may result.
Pressure gauge 1 will indicate a slight drop in test pressure when valve B is opened, but should hold steady at the lower pressure. If the test pressure drops below the minimum requirements, close valve B, reconnect the air supply line and slowly open valve A to increase the pressure in the primary tank When the required pressure is indicated on gauge 1 close valve A, disconnect the test air supply line. Open valve B to equalize pressure in the primary tank and the interstitial space. Gauge 1 and gauge 2 should have the same pressure reading.

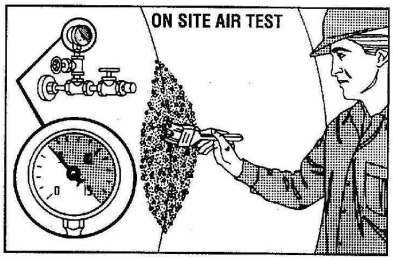
3.2.2.8 Close valve B. Hold the test pressure in the interstitial space for 1 hour minimum. A steady drop in pressure gauge 2 indicates there may be a leak in the interstitial space. Check the fittings, the gauges, and then retest. If the problem persists, contact the tank manufacturer.

3.2.2.9 Proceed to Section 3.2.3, "Detection of Leaks" below.

3.2.3 Detection of Leaks

3.2.3.1 Immediately apply the leak test solution to the tank exterior surfaces, welds, fittings, etc. Check for leaks. No leaks are allowed. If leaks are found, notify the tank manufacturer. If no leaks are found, testing of the tank is complete.

3.2.3.2 Open valve C, then slowly open valve B to release the test air pressure.



3.2.3.3 With the tank depressurized, remove the test piping, temporary plugs, caps and seals. Reinstall the emergency relief vents, etc. which were removed in Section 3.2.1 above. Emergency vents are required on both the primary tank and the secondary tank.
WARNING: Emergency relief vents must be operable to prevent causing tank failure by over-pressurization.

4.0 TANK PIPING AND ACCESSORIES

4.1 Install all permanent piping and fittings using compatible, non-hardening thread sealant material.

4.2 All unused tank openings must be properly sealed and tested to be liquid and vapor tight prior to putting the tank into service.

4.3 DO NOT WELD ON THE TANK, MODIFY OR PENETRATE THE TANK STRUCTURE IN ANY WAY WITHOUT THE EXPRESS WRITTEN PERMISSION OF THE TANK MANUFACTURER.

4.4 All tank accessories shall be installed as required per local codes. Anti-siphon devices, overfill shut-offs and alarms, vents gauges, emergency vents, etc. are common requirements for tanks storing motor fuels for the purpose of being dispensed into motor vehicles.

5.0 LABELING

5.1 Tanks shall be labeled in accordance with all applicable codes.

6.0 MAINTENANCE

6.1 The tank operator should perform periodic walk-around inspections to identify and repair areas of damage to the vessel or the coating itself and check for proper drainage around the tank area.

6.2 It is imperative that the tank exterior be inspected periodically to ensure that the integrity of the coating is maintained. The frequency of periodic repainting will be based upon environmental factors in the geographic area where the tank is located. Special consideration should be given to the selection of the paint, surface preparation and coating application. The coating selected should be suitable for use with the current coating, or the existing coating should be removed. The coating

Figure B-2 (continued)
Steel Tank Institute Fireguard Protected Aboveground Storage Tanks

selected should be of industrial quality.

6.3 Proper site preparation and maintenance are vital to ensure drainage of surface water. Should ground conditions change or settlement occur, take the appropriate steps to maintain proper drainage and prevent standing water near or under the tank area.

6.4 The primary tank shall be inspected monthly for the presence of water at the lowest possible points inside the primary tank. Remove any water found. Water and sediment in fuel can cause plugging of filters. Also, bacterial growth, originating from the fuel can cause corrosion of tanks and lines. For procedures on how to check for the presence of water and removal of water, refer to API Recommended Practice 1621, Appendix D and API Standard 2610. Another source of information is a report by the US Department of Energy Brookhaven National Laboratory, BNL 48406, which provides information on methods to test for and remove water, test for bacterial presence in fuel, tank cleaning and fuel additives.

6.5 This tank must be removed from service if damaged by fire exposure, other physical means or misuse.

6.6 Failure to adhere with these maintenance instructions may void your warranty.

6.7 Tank relocation requirements - often aboveground storage tanks are relocated. The following instructions are to be followed when this occurs: All steps are to be documented and the documentation is to be kept for the life of the tank.

6.7.1 The hazards associated with the cleaning, entry, inspection, testing, maintenance or other aspects of ASTs are significant. Safety considerations and controls should be established prior to undertaking physical activities associated with ASTs. Cleaning of tanks must be per state and local jurisdiction requirements.

6.7.2 Refer to the STI Standard SP001, "Standard for the Inspection of Aboveground Storage Tanks" for requirements concerning tank inspections. This SP001 Standard details requirements for inspections based on the tank installation and age. A tank must undergo the appropriate inspection prior to relocation.

6.7.3 In addition, the tank must be subjected to a pressure (or vacuum) test as detailed paragraph 3.2 above except an inert gas, such as nitrogen, should be used for tanks that have previously held fuel.

Disclaimer

These instructions are intended only as an aid to tank installers who are knowledgeable and experienced in aboveground tank installation. Compliance herewith does not necessarily meet the requirements of applicable federal, state and local laws, regulations and ordinances concerning tank installation. STI makes no warranties, express or implied, including but not limited to, any implied warranties of merchantability or fitness for a particular purpose, as a result of these installation instructions.